Product Data Sheet
CAP 300 Electric Arc Spray System

Oerlikon Metco's CAP 300 Electric Arc Spray System is designed to meet the needs of capacitor manufacturers, to spray coatings of zinc, aluminum, copper, tin and their alloys onto the end caps of capacitors.

The CAP 300 system has unique features that enable users to minimize the voltage for melting of the wire feedstock material and take advantage of its very short start/stop cycle of only 4 s. The CAP 300 spray plume is narrow for excellent control of coating placement. CAP 300 is designed for safe, reliable operation and meets CE standards.

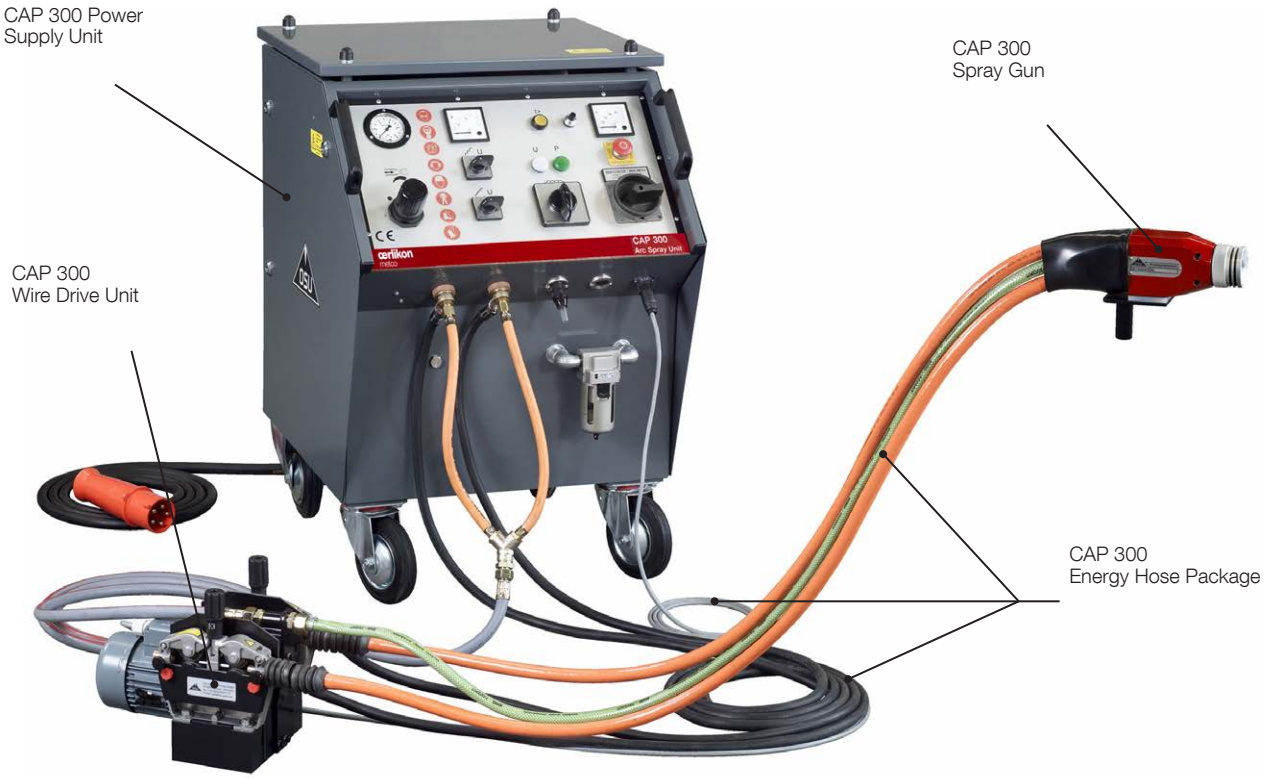
The suitability of this system for demanding capacitor applications has been proven at manufacturing facilities around the world. Simple and low cost operation, with infrequent change out of consumable parts and high reliability for continuous processing are the key features of the Oerlikon Metco CAP 300 Electric Arc Spray System.

1 Description

The system is optimized to apply coatings of zinc or zinc aluminum, however coatings of aluminum and tin can also be applied. The system is small and compact, with large wheels for easy mobility. It produces a very stable arc, resulting in excellent coating results.

The CAP Electric Arc Spray System comes equipped with all hoses and cables, and is composed of four modules:

- CAP 300 Wheeled Power Supply
- CAP 300 Spray Gun (LD/Schub 5) with Tool Post
- CAP 300 Wire Drive Unit (Push 6)
- CAP 300 Energy Hose Package



1.1 CAP 300 Power Supply

CAP-designated power supplies are specifically designed for capacitor end cap spray applications. The heart of the CAP 300 power supply is a rigid transformer rectifier system that guarantees the system can run at 100 % of the rated 300 A duty cycle without any degradation of power. PLC (programmable logic control) ensures accuracy and repeatability of the system settings.

An external control source can be used to start and stop the CAP 300 system, allowing integration into automated systems. Internally, the start/stop cycles are automatically controlled and can be as short as 4 s.

Controls are conveniently located on the front panel, with adjustments for spray capacity, atomizing air pressure and spray voltage. Supply connections for the power and compressed air are located on the back panel.

A fanless, convection cooling system prevents metallic dusts associated with the spray process from contaminating and damaging the power supply. In addition, the unit is protected against overloading, overheating and air pressure drops.

1.2 CAP 300 Spray Gun

The CAP 300 Wire Spray Gun is light and easy to use. It weighs only 1.7 kg (3.7 lb), has simple adjustments and requires minimal maintenance.

The two feedstock wires are passed through our special CAP 300 long-life contact tips and introduced into the arc at the front of the gun. After melting the wires with low voltage levels (approximately 18 V for zinc), the molten metal is atomized into small particles by compressed air.

The compressed air is passed through a uniquely designed, hard ceramic air cap. The atomized air is fully adjustable and an important factor to control particle size within a well-defined range with a small diameter spray pattern. This ensures the quality of the sprayed coating on the capacitor with high deposit efficiency.

A low voltage is necessary to keep the temperature of the molten spray particles as low as possible. This is especially critical to avoid damaging sensitive capacitor films.

1.3 CAP 300 Wire Drive Unit

The CAP 300 Wire Drive Unit is a push-type mechanism equipped with variable speed control that continuously transports the wire feedstock material to the spray gun.

The design minimizes the possibility of contamination of the spray system and ensures long service life of the contact tips. Four drive rollers per wire provide slip-free wire transport and avoids chipping of the wire surface.

The brushless motor is designed to be maintenance-free. A small, integrated worm gear box controls wire speed to that desired for the application.

Please refer to Section 3.1 for available factory-configurations and optional wire spray kits for various types and sizes of wires.

1.4 CAP 300 Energy Hose Package

The CAP 300 Energy Hose Package is composed of:

CAP 300 Flexible Hose Package has a standard length of 1.5 m (4.9 ft) and consists of two current cables that also feed the wire through specially designed, insulated wire guides, and an air hose for atomizing air. Other hose lengths are available.

CAP 300 Insulated Wire Guides have a standard length of 4 m (13.1 ft) and are made from a low friction material that ensures reliable wire transport. The length is easily shortened using any simple cutting tool. The guides connect the CAP 300 Wire Drive Unit to an optional drum or spool holder / decoiler.

CAP 300 Energy Cable Set has a standard length of 4 m (13.1 ft). The set connects the CAP 300 Wire Drive Unit with the CAP 300 Power Supply. It consists of two current cables with ring connectors at both ends and a compressed air hose for the atomizing air.

CAP 300 Remote Control Cable: Turns system on and off remotely and can be used for system automation. The cable has a standard length of 4 m (13.1 ft).

2 Features and Benefits

Effective

- Designed specifically for spraying capacitor end caps.
- Stable arc for reliable, repeatable coatings.
- Low, adjustable voltage prevents damage to capacitor film material.
- Lightweight spray gun can be installed on a wide variety of automated equipment.
- Remote start/stop from external control equipment.
- Adjustable atomizing air controls sprayed particle size range.
- Power supply operates at 300 A, 100 % duty cycle, without overheating or overloading.
- Two-channel emergency stop system integratable in-line.

Efficient

- Narrow spray pattern coats small areas with very good precision and less waste.
- Simple to use and maintain.

Economical

- Fan-free, convection-cooled power supply prevents contamination from overspray dust.
- Maintenance free, brushless motor.
- Long-life contact tips.

Environmental

- Tight spray pattern for reduced overspray waste.
- Excellent deposit efficiency also reduces waste.

3 Options and Accessories

Oerlikon Metco supplies a number of options for the CAP 300 Electric Arc Spray System, including components for spraying different wire sizes and spool types. Please contact your Oerlikon Metco Sales Representative for more information.

Spool Adapters: Hasp-style spools are standard. Adapters are available for dorn-style spools and baskets.

Spool Holder / Decoiler: All customers should choose an appropriate spool holder / decoiler. This option holds the wire in place and ensures smooth guidance through the wire feed system. Available for hasp-style spools and drums.

Remote Control Box: Turns system on and off from a remote location and can be used for manual testing from an automated system.

3.1 Spray Kits

The CAP 300 Arc Spray System is versatile, and can be used with many different types of wires and wire sizes using optional Spray Kits. All spray kits include the following hardware:

- One (1) air cap
- Two (2) contact tips
- Four (4) pair “Push 6” drive and pressure rollers
- Two (2) sets of wire guide tubes for use with the 1.5 m and 4 m hose packages

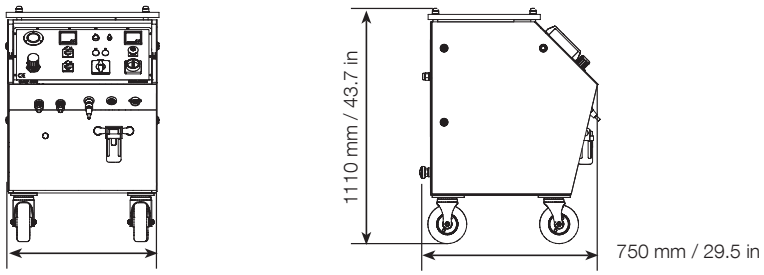
Spray Kit	Order Number	Wire Type	Wire Size
Hard Wire Spray Kit 1 [a]	1061430	Hard wires	1.6 mm (14 AWG)
Hard Wire Spray Kit 2 [b]	1061431	Hard wires	2.0 mm
Soft Wire Spray Kit 1 [a]	1061432	Zinc, 85Zn/15Al, 95Al/5Mg	1.6 mm (14 AWG)
Soft Wire Spray Kit 2 [a]	1061433	Zinc	2.0 mm
Soft Wire Spray Kit 3 [a]	1061434	Zinc, 85Zn/15Al, 95Al/5Mg	2.5 mm, 2.3 mm (11 AWG)
Soft Wire Spray Kit 4	1061435	85Zn/15Al, 95Al/5Mg	2.0 mm
Soft Wire Spray Kit 5	1061436	Aluminum	1.6 mm (14 AWG)
Soft Wire Spray Kit 6	1061437	Aluminum	2.0 mm
Soft Wire Spray Kit 7	1061438	Aluminum	2.5 mm, 2.3 mm (11 AWG)
Soft Wire Spray Kit 8	1061439	Sprababbitt™, Tin	2.0 mm
Soft Wire Spray Kit 9	1061440	Sprababbitt™, Tin	2.5 mm, 2.3 mm (11 AWG)

[a] Can be specified for factory configuration on new spray equipment

[b] Better results are obtained using 1.6 mm wires and high melting point hard wires above 1.6 mm should be completely avoided

4 Technical Data

4.1 Dimensions



4.2 Specifications

Power supply				
Weight (without spool holder device)	228 kg 503 lb	224 kg 494 lb	224 kg 494 lb	224 kg 494 lb
Electrical requirements [a]	200 V, 50/60 Hz	400 V, 50/60 Hz	415 V, 50/60 Hz	460 V, 50/60 Hz
Primary current	< 35 A	< 18 A	< 17 A	< 17 A
Fuse	50 A	32 A	32 A	32 A
Nominal power	< 11 kVA	< 11 kVA	< 11 kVA	< 11 kVA
Secondary current	300 A	300 A	300 A	300 A
Voltage	18 to 31 V (12 steps)	18 to 31 V (12 steps)	18 to 31 V (12 steps)	18 to 31 V (12 steps)
Open circuit voltage	21 to 36 V	21 to 36 V	21 to 36 V	21 to 36 V
Duty cycle (at full amperage)	100%	100%	100%	100%
Cooling	Ambient air – convection	Ambient air – convection	Ambient air – convection	Ambient air – convection
Wire Drive Unit	**CAP 300 (Push 6)**			
Weight	12 kg		26.4 lb	
Power (nominal)	0.18 kW			
Speed control type	Inverter			
Wire feed	4 drive rolls per wire			
Spray Gun	**LD/Schub 5**			
Weight (with 1.5 m hose pkg.)	4.6 kg		10.1 lb	
Nozzle system	Closed nozzle system			
Air Requirements				
Supply pressure (max.)	10 bar		145 psi	
Atomizer air	1250 NLPM @ 4 bar		2853 SCFH @ 58 psi	
Air purity	Filtered, dry, oil-free, in accordance with DIN ISO 8573 Class 1			
Recooled air temperature (min.)	25 °C		77 °F	
Hose and Cable Set				
Length [b]	1.5 m (LD/Schub 5) + 4 m		4.9 ft (LD/Schub 5) + 13.1 ft	
Wire Materials				
Compatibility	All solid electric arc wires available from Oerlikon Metco in appropriate wire sizes (no cored wires)			
Wire diameters	1.6 mm, 2.0 mm, 2.3 mm, 2.5 mm		14 AWG, 0.079 in, 11 AWG, 0.098 in	
Spray rates (examples)				
Al	9 kg/h		20 lb/h	
Cu	15 kg/h		33 lb/h	
Sn	60 kg/h		132 lb/h	
Zn	30 kg/h		66 lb/h	
85Zn 15Al	26 kg/h		57 lb/h	

[a] Other voltages available on request

[b] Other lengths available on request

Information is subject to change without prior notice.

www.oerlikon.com/metco
info.metco@oerlikon.com